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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,918	07/24/2001	Suresh Golwalkar	35706.9100	4220

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2507 WEST GENEVA DRIVE  
TEMPE, AZ 85282

EXAMINER

DINH, JACK

ART UNIT PAPER NUMBER

2873

DATE MAILED: 10/23/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicant(s)

09/911,918

Applicant(s)

GOLWALKAR ET AL.

Examiner

Jack Dinh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 June 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 3-92 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,6-11,13-35,41,42 and 46-92 is/are allowed.
- 6) ☒ Claim(s) 4,5,39,40,43,45 is/are rejected.
- 7) ☒ Claim(s) 44 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☒ Other: **DETAILED ACTION**.

### DETAILED ACTION

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

1. Claims 4, 39, 43 and 45 are rejected under 35 U.S.C. 102(a) as being anticipated by Ando et al. (U.S. Patent 6,476,379).

(a) Regarding claim 4, Ando et al (figure 2) is interpreted as disclosing an optical coupler **20** comprising an electrical connector **27**, an optical transmission medium **25** disposed proximate the electrical connector, and an encapsulant **23** surrounding at least a portion of the connector and at least a portion of the transmission medium, wherein the electrical connector **27** includes a conductive lead having a first end and a second end, wherein the first end is disposed about ninety degrees from the second end (see figure 2).

(b) Regarding claim 39, Ando et al (figure 2) is interpreted as disclosing a method of forming an optical coupler comprising the steps of creating electrical connectors **27**, attaching a waveguide **25** to the electrical connectors, and encapsulating **23** at least a portion of the electrical connectors and at least a portion of the waveguide, wherein the step of creating electrical connectors comprises providing a leadframe and bending the leads (see figure 2).

(c) Regarding claims 43 and 45, Ando et al (figure 2) is interpreted as disclosing a method of forming an optical coupler comprising the steps of creating electrical connectors **27**, attaching a waveguide **25** to the electrical connectors, and encapsulating **23** at least a portion of the electrical

connectors and at least a portion of the waveguide, and coating an end of the electrical connectors with a conductive material (col. 9, 36-38).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. (U.S. Patent 6,476,379) in view of Kuczynski (U.S. Patent 6,356,686).

Regarding claim 5, Ando et al (figure 2) is interpreted as disclosing an optical coupler 20 comprising an electrical connector 27, an optical transmission medium 25 disposed proximate the electrical connector, and an encapsulant 23 surrounding at least a portion of the connector and at least a portion of the transmission medium, wherein the electrical connector 27 includes a conductive lead having a first end and a second end, wherein the first end is disposed about ninety degrees from the second end (see figure 2). Ando et al. is interpreted as disclosing all the claimed limitations except that the encapsulant includes silica-filled epoxy material. Within the same field of endeavor, Kuczynski discloses the teaching that encapsulant includes silica-filled epoxy material is known in the art (col. 7, lines 60-66). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide silica-filled epoxy material into the encapsulant, as taught by Kuczynski, for the purpose of adjusting the flow properties of the encapsulant.

3. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ando et al. (U.S. Patent 6,476,379).

Regarding claim 40, Ando et al (figure 2) is interpreted as disclosing a method of forming an optical coupler comprising the steps of creating electrical connectors **27**, attaching a waveguide **25** to the electrical connectors, and encapsulating **23** at least a portion of the electrical connectors and at least a portion of the waveguide, wherein the step of creating electrical connectors comprises providing a leadframe and bending the leads (see figure 2). Ando et al discloses all the claimed limitation except for the steps of patterning a surface of a plate of conductive material, etching the plate of conductive material to form conductive leads. However, these steps would be considered as obvious by an ordinary skilled in the art. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to provide these steps for the purpose of forming the conductive leads.

***Allowable Subject Matter***

4. Claims 3, 6-11, 13-35, 41, 42, 46-92 are allowed. Claim 44 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter: The present application relates generally to optoelectronic devices. More particularly, the invention relates to apparatus for coupling optical fibers to optoelectronic devices, systems

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including the apparatus and optoelectronic components, and methods of forming the apparatus and system. The prior art taken either singly or in combination fails to anticipate or fairly suggest the limitations of the independent or dependent claims, in such a manner that a rejection under 35 USC 102 or 103 would be improper.

Regarding claim 3, the prior art fails to disclose that each of the fused fibers have a core diameter smaller than about 50 microns.

Regarding claim 8, the prior art fails to disclose the die attachment material to facilitate bonding of the connector to a substrate.

Regarding claim 9, the prior art fails to disclose that the conductive tape configured to facilitate coupling the connector to an optoelectronic device.

Regarding claim 10, the prior art fails to disclose that the electrical connector includes a conductive plug within the microelectronic device.

Regarding claim 13, the prior art fails to disclose that the electrical connector formed at least partially within the encapsulant.

Regarding claim 18, the prior art fails to disclose that at least a portion of the encapsulant comprises a transfer mold compound.

Regarding claim 20, the prior art fails to disclose a substrate comprising electrical connectors formed as electrical traces and conductive plugs.

Regarding claim 21, the prior art fails to disclose that the guide groove is formed of conductive material.

Regarding claim 23, the prior art alone or in combination fails to disclose an optical interconnect system comprising an optical couple comprising a waveguide, an encapsulant, and

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an electrical connector formed at least partially within the encapsulant, a fiber optic cable attached to the optical coupler, and a substrate electrically couple to the coupler.

Regarding claim 41, the prior art fails to disclose the step of polishing the end of the waveguide.

Regarding claim 42, the prior art fails to disclose the step of singulating.

Regarding claim 44, the prior art fails to disclose the step of attaching a conductive tape to an end.

Regarding claim 48-52, the prior art fails to disclose an optical transceiver wherein a photonics component flip-chip mounted to the electrical connector.

Regarding claim 53-57, the prior art alone or in combination fails to disclose an optical transceiver comprising an electrical connector, an optoelectronic component mounted to the first portion of the electrical connector, a substrate attached to a second portion of the electrical connector, an optical transmission medium disposed proximate the electrical connector, an encapsulant surrounding the connector and the transmission medium, and a guide groove formed within a portion of the encapsulant.

Regarding claim 58, the prior art fails to disclose the step of encapsulating for maintaining the electrical connector and the waveguide in a fixed space relationship.

Regarding claim 70, the prior art fails to disclose an encapsulant for maintaining the electrical connector and the optical transmission medium in a fixed space relationship.

Regarding claim 71, the prior art fails to disclose an optical transmission medium comprising fused optical fibers having a core diameter less than the first core diameter of the optical fiber.

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Regarding claim 81, the prior art fails to disclose an optical transmission medium juxtaposed with the electrical connector, an optical path of the optical transmission medium being parallel to and coextensive with at least a portion of the electrical connector, and an optoelectronic device attached to the electrical connector transverse to the optical path and adjacent one end of the optical transmission medium.

Regarding claim 86, the prior art fails to disclose an optical transmission medium attached to the electrical connector wherein the optical transmission medium being parallel to at least a portion of the electrical connector such that a surface portion of the electrical connector and an end surface of the optical transmission medium form a substantially coplanar surface, and an optoelectronic device attached to the surface portion of the electrical connector and adjacent the optical transmission medium at the coplanar surface.

***Other Information/Remarks***

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Curzio (U.S. Patent 5,611,013), Baldwin et al. (U.S. Patent 5,329,604), and Noddings et al. (U.S. Patent 5,574,814) disclose couplers for optoelectronic devices.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Dinh whose telephone number is (703) 605-0744. The examiner can normally be reached on M-T (8:30 AM - 6:30 PM).




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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Georgia Y Epps can be reached on (703) 308-4883. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

October 6, 2003

Jack Dinh  
Patent Examiner



Georgia Epps  
Supervisory Patent Examiner  
Technology Center 2800